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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/700,063	10/31/2003	Richard Edwin Warren JR.	RD-27511-1	3737

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

EXAMINER

ELVE, MARIA ALEXANDRA

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 05/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/700,063

Applicant(s)

WARREN ET AL.

Examiner

M. Alexandra Elve

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6-22 is/are rejected.
- 7) ☒ Claim(s) 4 and 5 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/03, 2/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 & 6-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sokol et al. (USPN 6,254,703) in view of Dykes et al. (USPN 6,548,782) and Staver et al. (USPN 5,987,042).

Sokol et al. discloses a method and apparatus for quality control of laser shock processing. This includes measuring emissions and characteristics of the workpiece, using, for example, a radiometer or acoustic detection devices. Laser shock peening uses overlay(s) which maybe transparent (usually water or C, H, O type materials) or opaque (oil, tapes, paint and so forth). The radiometer (24) detects spectral emissions (22) and the acoustic detector (26) detects acoustic energy emissions (20). The radiometer measures a portion of the optical spectrum and is directed towards the workpiece (14) and in particular, that of the opaque overlay (10) such that radiometer (24) may measure the temperature of the workpiece and/or the plasma when a laser pulse irradiates them. Different types of radiometers may be used, such as UV, visible,

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IR or narrower bands. These measurements yield real-time or in-process monitoring of the effectiveness of the laser shock peening.

Measurements may be implemented with a spectrometer or an array of fast photodiodes with narrow-band line filters selected to encompass the line of interest. Correctional or tables of the measurements may be generated. Thus a predetermined or desired range for a workpiece may be determined. In addition, one can use this method for producing uniform compressive residual stresses in a workpiece. (abstract, figure, col. 1, lines 18-30, col. 4, lines 20-67, col. 5, col. 6, lines 1-12, 47, col. 7, lines 10-15, 62-65, col. 8, lines 4-24, col. 9, lines 17-27)

Sokol et al. does not specifically teach the use of a controller or a laser with Q-switch and a clock signal.

Dykes et al. disclose a laser shock peening system, which uses an overlay. The laser beam (16) irradiates the workpiece (20) having an overlay (40) while a measurement device (15) measures the thickness of the both overlays (paint and water). The location of the measurement device may be located either near or outside the processing chamber. A control unit, such as a controller (28) is connected to the overlay, the workpiece, the measurement device, laser, positioning mechanism and so forth. Thus the system may be controlled real-time during the laser shock peening process. (abstract, figures, col. 4, lines 31-35, col. 6, col. 7, lines 25-67, col. 8, lines 10-53, col. 9, lines 34-47, col. 10, lines 45-51)

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a controller, as taught by Dykes et al. in the Sokol et al. system

because the laser shock process may be controlled in-process or real-time and yield a product which meets desired parameters or predetermined ranges.

Staver et al. discloses a laser shocking processing system that improves workpiece surface characteristics by the formation of a surface layer in the material, which is in a state of compression. Typically, these systems use a transparent inertial confinement layer such as water. Laser pulses have to be controlled by a master clock trigger in order to optimize the exposure of the workpiece to laser peening. Actively controlling the relative timing of the laser pulse and the opening of the optical switch will result in a defined pulse that has a shape for effectively generating the desired mechanical stresses in the laser shock peened workpiece (target). The pulse generator controls the laser by actuating a high voltage relay, powered by a high voltage power supply that opens and closes the Q-switch in the laser oscillator. (abstract, figures, col. 1-2, col. 3, lines 22-50)

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a laser with Q-switch and a clock signal, as taught by Staver et al. in the Sokol et al. system because well defined and accurately spaced laser shock peening pulses will effectively generate the desired mechanical stresses in the laser shock peening workpiece (target).

Allowable Subject Matter

Claims 4-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the claims as supported by the specification differs from the prior art in that it does not teach a system for laser shock peening having a logical AND gate coupled to the detector and pinhole aperture aligned with the detector.

Conclusion


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See US PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Alexandra Elve whose telephone number is 571-272-1173. The examiner can normally be reached on 6:30-3:00 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on 571-272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

May 10, 2005.



M. Alexandra Elve
Primary Examiner 1725